

3.0 AFFECTED ENVIRONMENT

The affected environment describes the existing condition of the environmental resources within the project area. Resources potentially susceptible to impacts from the proposed double-circuit reconfiguration project are identified and described below. These include:

- Land Use
- Biological Resources
- Cultural Resources
- Visual Resources
- Air Quality
- Water Resources
- Geology and Soils
- Noise
- Socioeconomic Resources
- Health and Safety
- Hazardous Materials and Solid Waste

3.1 LAND USE

Land Ownership/Management

Existing land ownership within the project area falls under three Federal agency jurisdictions and one local agency jurisdiction (see Figure 1-1). The three areas with Federal agency jurisdiction include the Lake Mead National Recreation Area (LMNRA), managed by the U.S. Department of the Interior's (DOI) NPS; the Hoover Dam Reservation Area, managed by DOI's BOR; and land associated with the Mead Substation managed by the DOE's Western Area Power Administration. Approximately half of the lands within the project area fall under Boulder City municipal jurisdiction, which is immediately adjacent to the LMNRA. Near the Mead Substation at the southern extent of the project area, the proposed Western's transmission line crosses Federal lands administered by Western (Table 3-1).

TABLE 3-1			
SUMMARY OF LAND OWNERSHIP, STRUCTURES, AND RIGHT-OF-WAY OCCUPATION			
Ownership	Approx. Number of Structures	Approx. Length	Approx. ROW Area*
Boulder City	23	4.74 miles	115.0 acres
National Park Service	6	2.24 miles	54.42 acres
Bureau of Reclamation	2	0.71 miles	17.08 acres
Western	2	1.11 miles	27.0 acres
TOTAL:	33	8.8 miles	213.5 acres
* Calculated using a 200-foot ROW width			

Existing Land Use

Existing land use in the project area includes utility ROW where various transmission lines extend through an approximate 1,000-foot wide utility corridor between the Hoover Dam and the Mead Substation. Within this corridor, Western occupies approximately eight miles or 190 acres of ROW for the existing Hoover-Mead #7 and #5 Transmission Lines. Except for these existing transmission line facilities, the project area is primarily undeveloped.

The Hoover Dam Reservation Area (Reservation) delineates lands managed by BOR for security purposes and to operate and maintain the Hoover Dam, its buildings and structures, electric transmission lines, structures, switchyards, and spoil disposal sites. BOR has not prepared a specific management plan to guide development within the Reservation; however, public access to certain areas within the Reservation is restricted, and portions of the area are fenced (FHWA 2001).

On the north end of the project area, the existing transmission line corridor extends through the Eldorado Mountains and a Wilderness Suitability Area within the LMNRA. Within the LMNRA, there are multiple recreation trails and established NPS backcountry roads. These roads and trails are frequently used for hiking, equestrian activities, and four-wheel vehicle use. As such, NPS's priority is to maintain access to these roads and trails. No pedestrian or bicycle routes are within the immediate project vicinity for the proposed project; however, many different recreationalists use existing transmission line maintenance roads throughout the project area.

Boulder City is comprised of an urban and suburban core with undeveloped open space. Developed land uses in the city are about one mile from the project area. The developed land uses within the community are primarily residential, while commercial/retail uses are concentrated in the city's northwest area. Along the southern-most portion of the corridor, the proposed transmission line facilities would be located near the private Boulder City Rifle Range, located within 0.25-miles east of the transmission line corridor. In this same area, the Boulder City Municipal Landfill is west of the proposed project alignment. The 100-acre landfill currently serves Boulder City and the LMNRA. The Mead Substation and the BOR's Southwestern Complex, are at the southern end of the project area.

No agricultural land uses occur within the project area, and no areas are designated for future agricultural development. Areas of the County used for livestock grazing purposes are generally in Northeast Clark County along the Muddy and Virgin River Valleys. The majority of rangeland used within Clark County is for animals such as feral horses, burros, mule deer and desert bighorn sheep. The LMNRA is closed to livestock grazing for environmental reasons.

Planned Land Use

Lands immediately adjacent to the proposed project facilities are almost entirely devoted to electrical transmission lines. Although no formally designated utility corridors are associated with the proposed project, land management agencies incorporate these transmission lines and non-designated utility corridors into their land use plans.

The NPS Lake Mead General Management Plan (GMP) was approved in 1986 for a period of 25 years. The project area is located within the Boulder Basin Zone of the GMP. The land next to the existing transmission line corridor is in the Natural Environment sub-zone. This sub-zone emphasizes natural resources conservation and environmentally compatible recreational activities. This sub-zone contains land with natural values and is not open to domestic livestock grazing.

The Clark County Multi-Species Habitat Conservation Plan (MSHCP) was approved in November 2000. The plan addresses the conservation needs of many biological resources in Clark County. The plan's primary objective is to achieve a balance between conservation of natural habitat and native species of Clark County, and the beneficial use of the land for development purposes.

Boulder City is currently updating its Master Plan, completed in 1991. The Master Plan focuses on the community's developed portion and does not identify planned land uses near the project area. The Master Plan Update identifies a long-term desire to provide access to adjacent public lands and regional trails. Although no formal planned trails have been designated, the plan identifies several potential linkages to a regional trails network that serves the outlying areas of Clark County.

Other land uses planned for the project area include the U.S. 93 Hoover Dam Bypass Project and the U.S. 93 Boulder City Bypass Highway Project, where a preferred corridor has been identified parallel to a major portion of the proposed project facilities.

3.2 BIOLOGICAL RESOURCES

Vegetation

Vegetation within the project area can be characterized as a creosote bush (*Larrea tridentata*) – white bursage (*Ambrosia dumosa*) community (Turner 1982), which are the most common plants in the Mojave Desert and within the project area. Other common species observed in the project area during pedestrian surveys include flat-topped buckwheat (*Eriogonum fasciculatum*), range ratany (*Krameria parvifolia*), brittle bush (*Encelia farinosa*), joint fir (*Ephedra nevadensis*), beavertail cactus (*Opuntia basilaris*),

barrel cactus (*Ferocactus ancanthodes*), and cholla (*Opuntia* spp.). Common herbs and forbs include desert mallow (*Sphaeralcea ambigua*), desert chicory (*Rafinesquia neomexicana*), little trumpet (*Eriogonum inflatum*), evening primrose (*Camissonia californica*), fiddleneck (*Amsinckia intermedia*), and spiny chorizanthe (*Chorizanthe rigida*). Common grasses include Arabian grass (*Schismus arabicus*), fluff grass (*Erioneuron pulchellum*), and red brome (*Bromus madritensis rubens*).

Wildlife

The project area supports wildlife characteristic of the Mojave Desert. Substrate, vegetation, topography, and distance to water are the important elements in determining wildlife habitat and diversity. For example, the desert tortoise (*Gopherus agassizii*) requires friable soils or natural shelter sites while desert bighorn sheep require steep mountainous terrain. The most abundant mammals are rodents, such as kangaroo rats (*Dipodomys* sp.), white-tailed antelope ground squirrel (*Ammospermophilus leucurus*), desert woodrat (*Neotoma lepida*), white-foot mice (*Peromyscus* sp.), and pocket mice (*Perognathus* sp.). Other common mammals in the project area include the desert bighorn sheep (*Ovis canadensis nelsoni*), desert cottontail (*Sylvilagus audubonii*), and black-tailed jackrabbit (*Lepus californicus*). Carnivores in the project area include the coyote (*Canis latrans*), mountain lion (*Felis concolor*), bobcat (*Lynx rufus*), gray fox (*Urocyon cinereoargenteus*), and kit fox (*Vulpes macrotis*). Common birds include the house finch (*Carpodacus mexicanus*), common raven (*Corvus corax*), mourning dove (*Zenaida macroura*), black-throated sparrow (*Amphispiza bilineata*), and cactus wren (*Campylorhynchus brunneicapillus*). Common reptiles include the desert horned lizard (*Phrynosoma platyrhinos*), side-blotched lizard (*Uta stansburiana*), collared lizard (*Crotaphytus collaris*), zebra-tailed lizard (*Callisaurus draconoides*), desert spiny lizard (*Sceloporus magister*), speckled rattlesnake (*Crotalus mitchelli*), western diamondback rattlesnake (*C. atrox*), sidewinder rattlesnake (*C. cerastes*) and desert tortoise. This list of wildlife species was compiled from Burt and Grossenheider 1976; Clark County 2000; Heindl 2001; FHWA 2001; and Turner 1982.

Special Status Species

The U.S. Fish and Wildlife Service (USFWS) endangered, threatened, proposed, and candidate species occurring within Clark County are presented in Table 3-2. The list of special status species was examined to assess their potential to occur within the project study area. The majority of these Federally listed species were eliminated from further review based on the following criteria:

- Criteria 1) Their known geographic ranges and distribution are distant from the project study area.
- Criteria 2) The project study area does not contain conditions similar to those known to be necessary to support these species.

<p align="center">TABLE 3-2</p> <p align="center">SUMMARY OF USFWS LISTED SPECIAL STATUS SPECIES FOR CLARK COUNTY</p> <p align="center">AND EVALUATION OF OCCURRENCE WITHIN THE PROJECT AREA</p>			
Species	Status	Potential Occurrence Within Study Area; Basis of Occurrence Determination	Evaluation and Elimination Criteria
Bald eagle <i>Haliaeetus leucocephalus</i>	T	Possible; suitable habitat (cliffs near water such as reservoirs). Wintering birds are known to occur in the LMNRA.	This species may occur within the project area and is not eliminated.
Bonytail chub <i>Gila elegans</i>	E	None; no suitable aquatic habitat.	Criteria 2
Colorado pike minnow <i>Ptychocheilus lucius</i>	E	None; no suitable aquatic habitat.	Criteria 2
Desert tortoise <i>Gopherus agassizii</i>	T	Present; project area includes low, desert creosote bush scrub vegetation typical of desert tortoise habitat.	This species occurs within the project area and is not eliminated.
Devil's Hole pupfish <i>Cyprinodon diabolis</i>	E	None; no suitable aquatic habitat.	Criteria 2
Humpback chub <i>Gila cypha</i>	E	None; no suitable aquatic habitat.	Criteria 2
Lahontan cutthroat trout <i>Oncorhynchus clarki henshawi</i>	T	None; no suitable aquatic habitat.	Criteria 2
Moapa dace <i>Moapa coriacea</i>	E	None; no suitable aquatic habitat.	Criteria 2
Mountain plover <i>Charadrius montanus</i>	PT	None; no suitable habitat (open arid plains, short grass prairies, croplands, and scattered cactus).	Criteria 2
Pahrump poolfish <i>Empetrichthys latos</i>	E	None; no suitable aquatic habitat.	Criteria 2
Razorback sucker <i>Xyrauchen texanus</i>	E	None; no suitable aquatic habitat.	Criteria 2
Relict leopard frog <i>Rana onca</i>	C	None; no suitable aquatic habitat (requires springs).	Criteria 2
Southwestern willow flycatcher <i>Empidonax traillii extimus</i>	E	None; no suitable habitat (cottonwood/willow and tamarisk vegetation communities along rivers and streams. At elevations less than 8,500 feet).	Criteria 2
Virgin River chub <i>Gila seminuda</i>	E	None; no suitable aquatic habitat.	Criteria 2
Western yellow-billed cuckoo <i>Coccyzus americanus</i>	C	None; no suitable habitat (large blocks of riparian habitat along perennial streams or rivers).	Criteria 2
Woundfin <i>Plagopterus argentissimus</i>	E	None; no suitable aquatic habitat.	Criteria 2
Yuma clapper rail <i>Rallus longirostris yumanensis</i>	E	None; no suitable habitat (breeds in freshwater marshes and inhabit brackish water marshes and side waters preferring tall dense cattail and bulrush marshes).	Criteria 2

<p style="text-align: center;">TABLE 3-2</p> <p style="text-align: center;">SUMMARY OF USFWS LISTED SPECIAL STATUS SPECIES FOR CLARK COUNTY AND EVALUATION OF OCCURRENCE WITHIN THE PROJECT AREA</p>			
Species	Status	Potential Occurrence Within Study Area; Basis of Occurrence Determination	Evaluation and Elimination Criteria
<p>USFWS categories:</p> <p>Endangered (E) – Taxa in danger of extinction throughout all or a significant portion of its range;</p> <p>Threatened (T)/Proposed Threatened (PT) –Taxa likely to become endangered within the foreseeable future throughout all or a significant portion of its range;</p> <p>Candidate (C)– Species for which the USFWS has sufficient information on biological vulnerability and threats to support proposals to list as Endangered or Threatened. Candidate species, however, are not protected legally because proposed rules have not been issued. [Source: USFWS database (http://ifw2es.fws.gov/EndangeredSpecies/lists/)]</p>			

Based on review of the special status species in Table 3-2, the desert tortoise and bald eagle may occur within the project study area. These species and their relationship to the proposed project site are discussed in detail below.

Desert Tortoise

The Mojave population of the desert tortoise occurs west and north of the Colorado River, from southern Utah into Mexico. The tortoise is usually found in creosote bush scrub, with a preferred habitat including scattered shrubs with sufficient herbaceous understory to provide sustenance. The desert tortoise is completely terrestrial. Habitat requirements include cover sites, such as rock crevices for shelter and suitable substrates for digging burrows and nest sites. Throughout the Mojave Region, desert tortoises occur on flats and bajadas with soils ranging from sand to sandy-gravel, and rocky terrain and slopes (USFWS 1994b). Vegetation in desert tortoise habitat usually consists of scattered shrubs and abundant inter-shrub space for growth of herbaceous plants. The most common plant associated with their habitat is creosote bush. Desert tortoises are primarily herbivores, foraging on grasses, forbs, cacti, and the flowers of annual plants (USFWS 1994b). Activity patterns of the desert tortoise are closely tied to ambient temperatures, moisture, and forage availability. Desert tortoises spend much of their lives in burrows. They are active through the spring and portions of the summer through late fall. Their active season is typically defined as March 1 through October 31.

Field investigations confirmed that the southern portion of the project area (the first 5.2 miles north of the Mead Substation) is suitable desert tortoise habitat.

Bald Eagle

The bald eagle was Federally listed as endangered in 1967 (32 FR 4001), but later down-listed to threatened (USFWS 1995). It is currently proposed for removal from the list of endangered and

threatened species (USFWS 1999). Bald eagles are large birds of prey and adult birds are distinguished by a white head and tail, and a large yellow bill. Because of their large size, bald eagles require a substantial prey base consisting mainly of fish, small- and medium-sized mammals, and carrion. Nest sites are typically in large trees or on cliffs near water, where fish are abundant. Wintering birds are known to occur in the LMNRA (FHWA 2001). There are no nests or communal winter roosts in the project area.

Other Special Status Species

Other special status species are those plants and animal species that are of interest to the USFWS and/or the State but are not afforded any special protection under the Endangered Species Act (ESA). Rosy twotone beardtongue (*Penstemon bicolor* ssp. *roseus*), Las Vegas bearpaw poppy (*Arctomecon californica*), banded Gila monster (*Heloderma suspectum cinctum*), chuckwalla (*Sauromalus obesus*), peregrine falcon (*Falco peregrinus*), western burrowing owl (*Athene cunicularia hypugea*), desert bighorn sheep (*Ovis canadensis nelsoni*), and several bat species may occur within the project area, and are discussed in more detail below.

Rosy Twotone Beardtongue

Rosy twotone beardtongue is a Federal species of concern. This perennial plant typically occurs in gravel washes or disturbed roadsides at elevations from 1,800 to 4,800 feet and flowers from mid-March to mid-May (Nevada Natural Heritage Program 2001). It is known to occur within the LMNRA but has not been observed in the project area (FHWA 2001; Heindl 2001). No rosy twotone beardtongue was observed during field investigations.

Las Vegas Bearpaw Poppy

The Las Vegas bearpaw poppy, a Federal species of concern, is a perennial plant that grows in areas such as barren, gravelly desert flats, hummocks, and slopes. This species occurs within the LMNRA; however, it was not observed during field investigations and is unlikely to occur in the project area.

Banded Gila Monster

Banded Gila monsters are protected from collection or killing under Nevada law (Nevada Revised Statute [NRS] 501.110) and are a Federal species of concern. This species is common in mountainous areas throughout the region. Gila monsters are likely to occupy rocky outcrops; however, they could occur virtually anywhere in the project area (Stebbins 1985).

Chuckwalla

Chuckwallas, a Federal species of concern, are protected from collection or killing under Nevada law (NRS 501.110). The chuckwalla is found throughout the deserts of the southwestern United States and northern Mexico. Chuckwallas inhabit rock outcrops where cover is available between boulders or in rock crevices typically on slopes and open flats below 6,100 feet. Typical habitat includes rocky hillsides and talus slopes, boulder piles, lava beds, or other clusters of rocks (Stebbins 1985). Habitat for this species exists over the northern portion of the project area. Numerous chuckwalla signs were located during the field investigations.

Peregrine Falcon

The peregrine falcon, a Federal species of concern, was previously Federally listed as endangered but was removed from the list in 1999 (USFWS 1999). This species is found across North America and typically occurs on isolated cliff ledges throughout their range (American Ornithologists Union 1983). Their principal prey species are passerine birds, waterfowl, and shorebirds (Johnsgard 1990). Peregrines may travel up to 17 miles from nest sites to hunting areas, which are often cropland, meadows, river bottoms, marshes, and reservoirs which attract abundant bird life (Ellis 1982). Breeding territories could be situated within the mountainous portions of the project area (FHWA 2001). No peregrine falcons were observed during field surveys.

Western Burrowing Owl

Western burrowing owls, a Federal species of concern, are generally associated with open habitats such as grasslands, pastures, desert scrub, and margins of agricultural fields. They can adapt to urban environments. This species has a strong association with other burrowing species, such as rodents (Brown 2001). No suitable habitat was observed during field surveys.

Desert Bighorn Sheep

Desert bighorn sheep, a state protected species, occupy the mountainous portion of the project area and several were observed and photographed during the field investigations. The combination of rugged topography and water availability in the project area provides high quality habitat for this species. The northern Eldorado Mountains and adjacent River Mountains support one of the most important bighorn populations in the State (McQuivey 1978). Field surveys confirmed that the northern portion of the project area is suitable bighorn sheep habitat (approximately three miles).

Bat Species

Several Federal species of concern and/or state protected bat species may occur in the project area. They include the big free-tailed bat (*Nyctinomops macrotis*), California leaf-nosed bat (*Macrotus californicus*), cave myotis (*Myotis velifer*), fringed myotis (*Myotis thysanodes*), greater western mastiff bat (*Eumops perotis californicus*), long-eared myotis (*Myotis evotis*), long-legged myotis (*Myotis volans*), small-footed myotis (*Myotis ciliolabrum*), spotted bat (*Euderma maculatum*), and Yuma myotis (*Myotis yumanensis*). Suitable roosting habitat exists for several species of bat in the mountainous portions of the project area. No significant bat roosts or colonies have been reported in the project area (FHWA 2001; Heindl 2001), nor were any observed during field surveys for this project. A significant bat roost is one frequently used by several bats; commonly deep caves or mine shafts and adits. These sites are easily identified by the accumulation of bat guano and odor at the site. The most extensive survey effort in the project vicinity was part of the environmental evaluation of the U.S. 93 Hoover Dam Bypass Project, which reported low densities of bats. Methods included mist netting and identifying bats from recording echolocation calls (FHWA 2001).

3.3 CULTURAL RESOURCES

Cultural resources are sites, places, objects, buildings, structures, or districts that are of archaeological, ethnohistorical, historical, architectural, cultural, or scientific importance. Federal laws and statutes protect such resources and must be addressed when Federally sponsored, funded, or licensed projects threaten cultural resources. Most notable among these are the Antiquities Act of 1906; the Archaeological Resources Act of 1979 (ARPA); the National Historic Preservation Act of 1966 (NHPA), as amended; NEPA; the Archaeological and Historical Preservation Act of 1974, which amends the Reservoir Salvage Act of 1960; and the American Indian Religious Freedom Act of 1978. The following discussion summarizes the Cultural Resources Inventory Report prepared for the proposed project by Transcon Environmental (Bassett 2003).

Archaeological Resources

Transcon conducted an intensive cultural survey of the project area associated with the Hoover Dam Bypass Project Phase II in April and May 2003 to identify cultural resources within and adjacent to the 200-foot utility ROW and existing access roads. The survey also made recommendations to mitigate these resources during structure placement and replacement, road construction and repair, and transmission line and road maintenance.

A literature review and record search was compiled from previous cultural resources studies, historic maps, and cultural resource site files located at the Harry Reid Center at the University of Nevada, Las Vegas and the BOR, Lower Colorado River Regional Office. About 58 previous cultural resource surveys have been conducted within one-half mile of the proposed project area. Recent surveys that overlap or are adjacent to the project area include the U.S. 93 Hoover Dam Bypass EIS and the U.S. 93 Boulder City Corridor Study. As a result of these previous surveys and other, less formal efforts, 55 previously recorded prehistoric and historic sites were identified within one-half mile of the proposed project area.

The 200-foot transmission line ROW was surveyed along with other survey areas near the Los Angeles Switchyard, Boulder City Tap, and Mead Substation, and along designated access roads in the project area. A total of about 600 acres were surveyed during an eight person-day field effort from March 19 through 22, 2003.

As a result of the previous cultural resource surveys and pedestrian surveys conducted for this project, 23 cultural resource sites have been identified within the project area (Table 3-3). All but four of these were previously recorded sites. Each previously recorded site was examined, compared to the current documentation, and reviewed for National Register of Historic Places (NRHP) eligibility. In addition, 15 isolated occurrences were identified during the field investigations. These include nine lithics or small lithic scatters, four historic rock clusters or cairns, and two historic artifacts. The lithics are mostly comprised of unworked local chalcedony flakes. By definition, isolated artifacts are ineligible for NRHP listing.

Of the 19 previously recorded sites, 12 were formerly determined eligible for NRHP listing. These include the Hoover Dam Historic District (26CK3916), the Hoover Switchyard and Transformer Complex (26CK4765), the U.S. Construction Railroad (26CK4046a), a compilation of 18 transmission lines (26CK5180), and eight individual transmission lines (26CK6249, 26CK6250, 26CK6237, 26CK6238, 26CK6240, 26CK6242, 26CK6251, and NV-27-O). The Hoover Dam Historic District has no delineated boundaries and includes each smaller recorded site (i.e. individual transmission lines) along with others away from the project area. Likewise, one of the transmission line designations (26CK5180) is a compilation of 18 separate transmission lines, and is also included in the eight recorded here. The Hoover Switchyard and Transformer Complex includes the Los Angeles and Metropolitan Water District Switchyards in the northern portion of the project area. The Sullivan Turquoise Mine site (26CK23) is unevaluated due to the uncertainty of its boundary and the highly dispersed nature of the site. Based on the field survey conducted for this project, the site does not extend into the project area and no features or

artifacts associated with this site were identified. An ethnographic study will examine this site as a potential traditional use place.

According to the Advisory Council on Historic Preservation (ACHP), for a resource to qualify for listing on the NRHP it must meet one or more of the following criteria:

- criterion a) Possess association with important events that have made a significant contribution to the broad patterns of our history.
- criterion b) Have an association with the lives of important persons.
- criterion c) Display distinctive characteristics of a type, period of method of construction, such as unique architecture, craftsmanship, or design.
- criterion d) Have the capacity to provide important information about the past.

<p style="text-align: center;">TABLE 3-3 ARCHAEOLOGICAL SITES WITHIN THE PROJECT AREA</p>			
Site No.	Site Type	Reference	NRHP
26CK23	Sullivan Prehistoric/Historic Turquoise Mining District	Wedding 2001	Unevaluated
26CK3916	Hoover Dam Historic District (no boundary delineated)	Middleton 1979	Eligible criteria a/c
26CK4046a	U.S. Construction Railroad	White 1997	Eligible criteria a/c
26CK4765	Hoover Switchyard and Transmission Complex	Queen 1992	Eligible criterion c
26CK5180	18 Transmission Lines	Blair 1994; Schweigert 1999	Eligible criterion a
26CK6237 NV-27-M	LABPL #2 Transmission Lines (Currently named Hoover-Mead #7 230-kV Transmission Line)	Schweigert 2002	Eligible criteria a/c
26CK6238 NV-27-M	LABPL #1 Transmission Lines	Schweigert 2002	Eligible criteria a/c
26CK6239	Reservation Boundary Road	Schweigert 2002	Ineligible
26CK6240 NV-27-P	Metropolitan Water District Transmission Line 1 (Currently named Hoover-Mead #5 230-kV Transmission Line)	Schweigert 2002	Eligible criterion a
26CK6241	Metropolitan Water District Transmission Line 2	Schweigert 2002	Ineligible
26CK6242 NV-27-M	LABPL #3 Transmission Lines	Schweigert 2002	Eligible criteria a/c
26CK6249	Southern California Edison North Transmission Line	Schweigert 2002	Eligible criterion a
26CK6250	Southern California Edison South Transmission Line	Schweigert 2002	Eligible criterion a
26CK6251 NV-27-O	Hoover-Basic South Transmission Line	Schweigert 2002	Eligible criterion a

<p style="text-align: center;">TABLE 3-3 ARCHAEOLOGICAL SITES WITHIN THE PROJECT AREA</p>			
Site No.	Site Type	Reference	NRHP
NV-27-O	Magnesium Basic #1 North Transmission Line (Currently named Henderson-Hoover 230-kV Transmission)	Schweigert 2002	Eligible criterion c
26CK6252	Joint Telephone Line and Construction Road	Schweigert 2002	Ineligible
26CK6253	Boulder City Tap to Boulder City #2 Substation 69-kV Line	Schweigert 2002	Ineligible
26CK6255	Basic Tap/Boulder City Tap Substation	Schweigert 2002	Ineligible
26CK6450	Hoover-Mead Transmission Line (formerly Davis-Hoover)	Schweigert 2002	Ineligible
26CK6723	Historic utility line	Bassett 2003	Recommended Ineligible
26CK6724	Historic road	Bassett 2003	Recommended Ineligible
26CK6725	2 rock circles; primary lithic reduction area	Bassett 2003	Recommended Eligible
26CK6726	3 rock shelters; lithics	Bassett 2003	Recommended Eligible

As shown in Table 3-3, four new sites were recorded. These sites are:

- 1) Site 26CK6723, which consists of three utility pole stubs, located near Hoover Dam. The site is recommended as ineligible for NRHP listing.
- 2) Site 26CK6724 consists of a short stretch of bulldozed road constructed to access electric transmission line structures originating at the Hoover Dam Switchyards. Four artifacts were identified in association with the road. The site is recommended as ineligible for NRHP listing.
- 3) Site 26CK6725 is a prehistoric site consisting of one partial and two complete stone circles and a small lithic scatter. The site is recommended as eligible for NRHP listing under criteria a and d.
- 4) Site 26CK6726 is a prehistoric site consisting of a distinctive conglomerate monolith that contains three separate rock shelters. One of the shelters has been extensively pot-hunted, and includes a small artifact scatter. The site is recommended as eligible for NRHP listing under criterion d.

Places of Traditional Cultural Importance to Native Americans

Identification of traditional places of cultural importance to Native Americans is being conducted in accordance with the NHPA, as amended in 1992, the American Indian Religious Freedom Act (AIRFA), and Executive Order 13007. Western is consulting with appropriate tribes to determine their concern for

specific places of traditional cultural importance. A list of tribes Western has consulted is provided in Chapter 5, Agencies and Persons Consulted. Western is committed to evaluate places of traditional cultural importance identified during tribal consultations to determine if they are traditional cultural places (TCPs) eligible for NRHP in accordance with National Register Bulletin 38. Places of traditional importance to Native Americans, or TCPs, may be either natural or cultural features they consider sacred, or culturally important. TCPs may include natural rock outcrops, archaeological sites, prayer circles, springs, and trails.

In previous studies for the U.S. 93 Hoover Dam Bypass Project, some Native American groups identified the Sullivan Turquoise Mine as significant. Additionally, in studies conducted for the U.S. 93 Boulder City Corridor Study, two cultural resource sites relating to the McClanahan District (26CK6278 and 26CK6281) located outside the Hoover Dam Bypass Phase II project area, were recommended as potential TCPs. Native American communities consulted for this project identified site 26CK6725 and site 26CK6726 as cultural properties of interest or concern to their communities which makes them eligible for the NRHP under criterion a. Western plans to conduct an ethnographic overview, which will further define TCPs in or near the project area.

3.4 VISUAL RESOURCES

The visual resources of the landscape associated with the proposed project area are a mixture of natural physical landscape elements (mountains, canyons, and valleys) and the human-made elements (transmission lines and structures, access roads, and substation infrastructure). The proposed project passes through various topographical settings. Steep mountains and canyons dominate the northern section, while the project's southern portion is composed of a series of washes and ravines and a large relatively flat bajada into the Eldorado Valley. Vegetation within the project area includes mostly small-scale brush species, such as creosote bush and bursage, which does not impede views that often extend to distant horizons. Multiple transmission lines and accompanying access roads bisect the landscape in many directions. Other high-voltage transmission line structures and conductors accompany the transmission line infrastructure that the proposed project would replace on either side for the entire project length. The infrastructure associated with the transmission line corridors is visually composed of various linear and geometric forms as well as metallic colors and textures. The unusually large amount of transmission infrastructure, its prominent scale, and its strong linear elements make it the dominant visual element within the project's existing landscape.

The proposed project is in a generally rural, undeveloped area and has only limited views from transportation corridors or residential areas, which include U.S. 93 near the La Hacienda Casino and Boulder City. Views from U.S. 93 to the existing facilities are momentary in nature and are generally absorbed by the presence of other transmission line facilities. Views toward the transmission corridor from Boulder City are limited by the distance of the community from the proposed project alignment and the presence of other transmission line infrastructure.

The proposed project passes through the LMNRA, managed by the NPS. To protect valuable scenic resources within the LMNRA, the NPS has identified and designated specific areas for special management. These areas are referred to as “outstanding natural features” and are selected based on uniqueness, critical habitat protection, aesthetic, and recreational value. There are no areas within the project alignment identified as outstanding natural features or scenic areas. Additionally, the proposed project passes through boundary limits of Boulder City. The Boulder City Master Plan identifies one of its goals as the need to “consider the historic, cultural, aesthetic, and visual relationships in the planning of the community” as well as to “support and promote efforts to improve the appearance and image of the community.”

3.5 AIR QUALITY

Air quality is determined by the concentration of various pollutants in the atmosphere. The type and amount of pollutants emitted into the atmosphere, the size and topography of the air basin, and the prevailing meteorological conditions are all important air quality factors. Based on the concentration of certain pollutants, commonly referred to as “criteria” pollutants, areas within Nevada are designated as: 1) non-attainment (areas in which ambient pollutant concentration exceed one or more of the Federal standards); 2) attainment (areas meeting Federal standards); or 3) unclassifiable (areas where no information is available to determine if standards are met).

Air quality is measured by ambient air concentrations of specific pollutants that have been determined by the U.S. Environmental Protection Agency (EPA) to be harmful to the public’s health and welfare. The EPA’s Prevention of Significant Deterioration (PSD) program requires Federal or State permits for new or modified sources of air pollution. The permits are intended to restrict new emissions in areas where the current air quality exceeds the quality standards. National Ambient Air Quality Standards (NAAQS) have been established for these criteria pollutants, (Table 3-4) to protect public health and to prevent environmental degradation (e.g., impairing visibility, damaging vegetation and property). The six criteria pollutants are ozone (O₃), carbon monoxide (CO), nitrogen dioxide (NO₂), sulfur dioxide (SO₂),

particulate matter (PM₁₀), and lead (Pb). EPA has classified the Las Vegas Valley as a serious non-attainment area for eight-hour carbon monoxide (CO) NAAQS based on monitored air quality data (Clark County 2003).

TABLE 3-4 AMBIENT AIR QUALITY STANDARDS FOR CLARK COUNTY		
Pollutant	Concentration Time	Primary
Ozone (O ₃)	1 Hour	0.12 ppm (235 µg/m ³) ³
Carbon Monoxide (CO)	1 Hour	35.0 ppm (40 mg/m ³)
	8 Hours	9.0 ppm (10 mg/m ³)
Nitrogen Dioxide (NO ₂)	Annual AM	0.05 ppm (100 µg/m ³)
Sulfur Dioxide (SO ₂)	3 Hours	0.10 ppm (260 µg/m ³)
	24 Hours	0.10 ppm (260 µg/m ³)
	Annual	0.03 ppm (60 µg/m ³)
Particulate Matter (PM ₁₀)	24 Hours	150 µg/m ³
	Annual AM	50 µg/m ³
Lead (Pb)	30 Days	1.5 µg/m ³
	Calendar Quarter	1.5 µg/m ³
<p>ppm - parts per million; mg/m³ - milligrams per cubic meter; µg/m³ - micrograms per cubic meter</p> <p>Notes:</p> <p>¹National standards (other than O₃, PM₁₀, and those based on annual periods) are not to be exceeded more than once per year. The new O₃ standard is based on a three-year average of the fourth highest eight-hour concentration in each year. For PM, the 24-hour standard is based on 99 percent (PM₁₀) or 98 percent (PM_{2.5}) of the daily concentrations, or averaged over three years.</p> <p>²Equivalent units given in parenthesis are based upon reference conditions of a 25 degrees Celsius (°C) 77 degrees Fahrenheit (°F) and 760 millimeters (mm) (30 inches) mercury.</p> <p>³EPA promulgated new Federal 8-hour O₃ and PM_{2.5} standards on July 18, 1997. The Federal 1-hour O₃ standard continues to apply in areas that remain in violation of that standard. [Source: Clark County 2003]</p>		

A portion of the project area is within the Eldorado Valley, which the Clark County Department of Air Quality Management (CCDAQM) has designated as a management area. Management areas often surround non-attainment areas and have the same or more stringent controls than a PSD area.

The closest CCDAQM air quality monitoring station operating near the study area is the Boulder City monitoring station at the U.S. 93 and Industrial Road intersection. The Boulder City monitoring station monitors CO, O₃ and PM₁₀. Table 3-5 presents a summary of the highest pollution values for CO and PM₁₀ recorded at this station in 1998, 1999, and 2000.

<p align="center">TABLE 3-5</p> <p align="center">SUMMARY OF CRITERIA POLLUTANTS MONITORED AT BOULDER CITY</p>								
Pollutant	Averaging Time	Federal Primary Standards	Maximum Concentrations ¹			Number of Days Exceeding Federal Standards ²		
			1998	1999	2000	1998	1999	2000
CO	1 Hour	35 ppm	5.1	6.2	4.7	0	0	0
CO	8 Hours	9 ppm	2.5	2.5	2.3	0	0	0
PM ₁₀	24 Hours	150 µg/m ³	69.0	76.0	188.0	0	0	0
PM ₁₀	Annual	50 µg/m ³	14.3	15.4	19.1	0	0	0
<p>Notes:</p> <p>¹ Concentration units for CO are in ppm; Concentration units for PM₁₀ are in µg/m³.</p> <p>² For annual standards, a value of 1 indicates that the standard has been exceeded.</p> <p>³ CO monitoring data for Boulder City is not available on AIRSData. CO data from the Pittman Monitoring Station (located at 1137 North Boulder Highway) was used. [Source: EPA 2001]</p>								

3.6 WATER RESOURCES

Surface Water

Annual precipitation in the project area averages about 4.1-inches per year. Runoff from these precipitation events, which are almost entirely rainfall from infrequent winter storms and summer thunderstorms, is conveyed through desert washes. Much of the precipitation runoff from the mountains in the area is routed to the Colorado River or into Lake Mead. The Colorado River and Lake Mead are the only perennial water sources in the region.

The Nevada Division of Environmental Protection retains statutory authority for water quality through its Bureau of Water Quality Planning (BWQP). The BWQP collects and analyzes water data, develops and assigns standards for surface waters, publishes informal reports, provides water quality education, and implements programs that address surface water quality.

Groundwater

No known groundwater resources are located within the project vicinity of Eldorado Mountains. Volcanic rocks comprising these mountains are not considered suitable for significant aquifers formation. In addition, the lower lying areas within the Boulder City limits and south into the alluvial fan also have no groundwater sources. No known water wells are present within the project area (USGS 2003).

Floodplains and Wetlands

A floodplain is “that portion of a river valley, adjacent to the channel, which is built of sediments deposited during the present regimen of the stream and is covered with water when the river overflows its banks at flood stages”. It is typically classified by the frequency of an expected storm that would lead to a flood large enough to cover an area to a specified elevation (American Geological Institute 1984). DOE defines floodplains as “the lowlands adjoining inland and coastal waters and relatively flat areas and floodprone areas of offshore islands including, at a minimum, that area inundated by a 1.0 percent or greater chance flood in any given year. The base floodplain is defined as the 100-year (1.0 percent) floodplain. The critical action floodplain is defined as the 500-year (0.2 percent) floodplain” (10 CFR 1022).

Of the six desert washes in the project area, one wash east of the Mead Substation has a floodplain designation of “Zone E”, which is defined as an area with a less than one percent chance of an annual flood. This wash was delineated as part of the Boulder City/U.S. 93 Corridor Study and is planned for a revised floodplain designation (FHWA 2002). The remaining washes in the project area have no floodplain designation.

Federal regulations define wetlands as “those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas” (40 CFR 230.3 and 33 CFR 328). Based on field investigations conducted in March and April 2003, no wetlands exist in the project area.

3.7 GEOLOGY AND SOILS

Local Geology

The transmission corridor extends through the Eldorado Mountains on the north and through bajadas (a wide, gentle slope of gravels) that have been washed down from the Eldorado Mountains on the south. The Eldorado Mountains are made up primarily of Precambrian metamorphic rocks with Precambrian intrusions dated at 1.37 billion years old. Atop these old rocks lie Tertiary volcanic rocks of mostly Oligocene and Miocene age (40 to 20 million years old). There are also Tertiary basalt flows of about the same general age as the tuffs. The entire system lies on the ancient Transcontinental Arch, which can be traced from about Minnesota to the Mojave Desert of California. This arch is all-Precambrian, and preserves many of Earth's earliest rocks. The Eldorado mountains were uplifted during the Miocene Basin and Range Uplift, about 15 million years ago (Bureau of Land Management [BLM] 2003).

Soils

Within the Eldorado Valley, rocks tend to disintegrate rather than decompose. Mechanical breakdown is common and localized rain events sweep large quantities of fragmented rock material into ravines and valleys, forming alluvial fans of coarser material. Finer-grained sediments are washed into the lowlands. Soils in this region are primarily Aridisols, which have one or more horizons that may have formed in the present environment, or may be relics from a former pluvial period. These soils do not retain water necessary to support plants, therefore, the surface is generally bare. Aridisols are often associated with desert pavement (BLM 1998).

Soils near the ground surface (0.5 feet in depth) are generally classified as very gravelly, sandy loam composed of mostly fine soil material. Underlying layers extending down to a depth of five feet contain more very gravelly, sandy loam and, in some areas, gypsum-based soil material or bedrock. Soil permeability ranges from 0.2 to 1.6 feet per hour, with the upper range of permeability generally occurring at depths greater than 10 feet (FHWA 2002).

Paleontological Resources

The inventory of paleontological resources examined specific geologic deposits and determined the known potential of those deposits to yield scientifically important or significant fossils. Because the Eldorado Mountains contain Precambrian (less than 570 million years ago) metamorphic rocks, no specific inventory for fossils was conducted in the project area, however fossils have been found in the Lake Mead region in years past. In 1987, a partial mammoth skeleton was exposed in an arroyo bank above the high water level of Lake Mead. The specimen was preserved in alluvial deposits originating from the Muddy Mountains near the Virgin River. This specimen represents the first reported *Mammuthus columbi* remains from this portion of Clark County, Nevada (Agenbroad and Brunelle 1992).

3.8 NOISE

Noise is defined as unwanted sound. Sound travels in waves from a specific source and exerts a sound pressure level (referred to as sound level), which is measured in decibels (dB). Zero dB corresponds roughly to the threshold of human hearing and 120 to 140 dB corresponds to the threshold of pain. Human response to noise is subjective and can vary greatly from person to person. Factors that can influence individual response include intensity, frequency, and time pattern of the noise; the amount of background noise present prior to the intruding noise; and the nature of work or human activity that is exposed to the noise. The adverse effects of noise include interference with concentration, communication, and sleep. At high levels, noise can cause hearing damage.

Environmental noise is usually measured in A-weighted decibels (dBA). Environmental noise typically varies over time, and different types of noise descriptors are used to account for this variability. Typical noise descriptors include maximum noise level (L_{max}, the highest instantaneous noise level observed in a given period), the energy-equivalent noise level (L_{eq}, the energy-equivalent noise level or “average” noise level, is the equivalent steady-state continuous noise level), and the day-night average noise level (DNL - the day-night average noise level is a weighted 24-hour noise level).

The DNL noise descriptor is commonly used to establish noise exposure guidelines for specific land uses. The noise level experienced at a particular site depends on the distance between the source and a specific receptor (humans, wildlife or sensitive places), presence or absence of noise barriers and other shielding features, and the amount of noise reduction provided by the intervening terrain. Some land uses are considered more sensitive to noise levels than others due to the amount of noise exposure (in terms of both exposure duration and insulation from noise) and the types of activities typically involved.

Baseline ambient noise levels were estimated using the relationship between population density and noise levels. The vast majority of the project area is uninhabited, although the proposed project alignment is within one mile of Boulder City. As a result, noise levels in the project area were estimated for the community of Boulder City and for the remaining undeveloped areas. The population density and related noise levels are presented in Table 3-6. These relationships are presented because ambient noise monitoring was not conducted as part of this analysis.

The population density in Boulder City is estimated to be 2,000 people per square mile, which would result in ambient noise levels of 55 dBA. The population throughout the rest of the project area is below 20 people per square mile, with associated ambient noise levels of 35dBA or below. In some areas along the proposed project alignment, noise levels would also be affected by vehicle traffic along U.S. 93, occasional aircraft overflights, and the Boulder City Rifle Range.

Boulder City does not have a noise element as part of its Master Plan.

TABLE 3-6 TYPICAL AVERAGE DAY-NIGHT SOUND LEVELS FOR VARIOUS POPULATION DENSITIES*		
Description	Population Density (people/square mile)	L_{dn} (dBA)
Rural (undeveloped)	20	35
Rural (partially developed)	60	40
Quiet Suburban	200	45
Normal Suburban	600	50
Urban	2,000	55
Noisy Urban	6,000	60
Very Noisy Urban	20,000	65
* For areas where there is no well-defined noise sources other than transportation noise. [Source: National Academy of Sciences (NAS) 1977.]		

3.9 SOCIOECONOMIC RESOURCES

Population/Demographics

The 2000 Census of Population and Housing lists Boulder City's population as 14,966, representing an increase of 2,399 persons from 1990, and a growth rate of 1.9 percent. By comparison, Clark County and the State of Nevada experienced average annual growth rates of 8.5 percent and 6.6 percent, respectively. The small growth rate for Boulder City is due primarily to local growth controls. In contrast, Clark County's rapid growth over the last decade can be attributed largely to growth in the gaming industry and related businesses in and around the City of Las Vegas. Table 3-7 displays the populations of the State of Nevada, Clark County, and Boulder City within the proposed project area.

TABLE 3-7 POPULATION BY AREA				
Area	Population		Population Change	
	1990	2000	Difference	Avg. Annual Growth 1990-2000
State of Nevada	1,201,833	1,998,257	796,424	6.6 %
Clark County	741,459	1,375,765	634,306	8.5 %
Boulder City	12,567	14,966	2,399	1.9 %
Source: U.S. Census Bureau 2000				

Population characteristics for the various racial and ethnic categories for Boulder City, Clark County, and the State of Nevada are presented in Table 3-8. The 2000 census data shows that 95 percent of Boulder City population is white. Persons of two or more races and other races account for 1.9 percent and 1.3 percent of the population, respectively. Approximately 4.3 percent of the population of Boulder City is of Hispanic or Latino origin.

**TABLE 3-8
ETHNIC COMPOSITION BY AREA**

Race	Boulder City		Clark County		State of Nevada	
	Persons	% of Total	Persons	% of Total	Persons	% of Total
TOTAL POPULATION:	14,966	100.0	1,375,765	100.0	1,998,257	100.0
White	14,149	94.5	984,796	71.6	1,501,886	75.2
Black or African American	109	0.7	124,885	9.1	135,477	6.8
American Indian and Alaska Native	108	0.7	10,895	0.8	26,420	1.3
Asian	107	0.7	72,547	5.3	90,266	4.5
Native Hawaiian and other Pacific Islander	24	0.2	6,412	0.5	8,426	0.4
Some other race	190	1.3	118,465	8.6	159,354	8.0
Two or more races	281	1.9	57,765	4.2	76,428	3.8
Hispanic or Latino Heritage*	650	4.3	302,143	22.0	393,970	19.7
* Persons of Hispanic or Latino heritage can be of any race. [Source: U.S. Census Bureau 2000]						

Economy/Income

The local economy near the proposed project is centered on Boulder City. The largest segments of employment in Boulder City are associated with services, construction, and retail trade. The median household income in Boulder City is substantially greater than either Clark County or the State of Nevada. Employment rates in the City have remained fairly steady since 1980, with an unemployment rate of 4.5 percent in 2000 (U.S. Census Bureau 2000 and Boulder City Master Plan 1991).

Environmental Justice

Executive Order 12898, "Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations," was issued by the White House in February 1994. The Executive Order focuses Federal agencies on the human health and environmental conditions in minority and low-income

communities and ensures that any adverse human health and environmental effect of agency actions that may disproportionately impact minority and low-income populations (including Native American Indian Tribes) are identified and addressed. Existing laws such as NEPA, provide the context and opportunity for Federal agencies to identify, address, and consider in decisions any potentially hazardous impacts.

Environmental Justice aims to ensure the fair treatment and meaningful involvement of all people with respect to developing, implementing, and enforcing environmental laws, regulations, and policies. Fair treatment means that no group of people, including a racial, ethnic or socioeconomic group, should bear a disproportionate share of potentially adverse human health and environmental effects of a Federal agency action, operation, or program. Meaningful involvement implies that potentially affected populations have the opportunity to participate in the decision process and their concerns are considered in the agency's decision.

No portions of the proposed project cross lands that are associated with any minority or low-income populations.

3.10 HEALTH AND SAFETY

Emergency Infrastructure

Boulder City police provides police services in the project area and the Boulder City Fire Department responds to fire emergencies. Non-critical emergencies are treated within Boulder City. People with severe medical emergencies are transported by ambulance to Las Vegas.

Public and Worker Safety

Current public and worker safety concerns are minimal within the project area. The existing transmission lines are within an undesignated utility corridor. Public access to the area is limited due to local road conditions, although the public does use roads in the area to access the landfill and the Boulder City Rifle Range.

Electric Magnetic Fields

Current and voltage associated with electric transmission lines are required to transmit energy over those lines. The current, a flow of electrical charge, is the source of a magnetic field. The voltage, which represents the potential for an electrical charge to do work, is the source of an electric field. Electrical magnetic fields (EMFs) surround every electrical device, including electrical appliances and power lines. Naturally occurring EMFs are associated with lightning, magnetic ores, and electric potentials found in

living cells. Table 3-9 provides typical EMFs from household appliances and from electrical transmission lines.

TABLE 3-9 EMF STRENGTH OF VARIOUS ELECTRICAL SOURCES						
EMF Source	Summary		Summary		Summary	
	Distance	Strength	Distance	Strength	Distance	Strength
COMMON HOUSEHOLD ITEMS¹						
Microwave Oven	0.5 ft	200 mG	1.0 ft	4 mG	-	-
Vacuum Cleaner	0.5 ft	300 mG	1.0 ft	60 mG	-	-
Hair Dryer	0.5 ft	300 mG	1.0 ft	1 mG	-	-
Electric Shaver	0.5 ft	100 mG	1.0 ft	20 mG	-	-
TRANSMISSION LINES²						
115-kV	0 ft	29.7 mG	49 ft	6.5 mG	200 ft	0.4 mG
230-kV	0 ft	57.5 mG	49 ft	6.5 mG	200 ft	1.8 mG
¹ Median field strength milligauss (mG) for typical 60Hz electric current. ² Typical power line right-of-way is 49 feet; "0" distance measurements were taken directly below lines of unknown height. Mean field strengths are based on 321 measurements; field strength may, depending on loads, be twice the mean. [Source: U.S. National Inst. of Environmental Health Sciences & Dep't of Energy, 1995. Questions and Answers about EMF Electric and Magnetic Fields Associated with the Use of Electric Power, 38-46.]						

3.11 HAZARDOUS MATERIALS AND SOLID WASTE

Potential hazards related to constructing and operating proposed project facilities include the possible existence of sites that could be contaminated by fuels, chemicals, or other toxic or hazardous substances, and the use of, or accidents involving, hazardous materials during construction activities.

There are no known hazardous waste sites within the designated utility corridor. A visual field survey and Internet investigation were performed to identify potential Superfund sites located near the project route. Superfund is an EPA-administered program to locate, investigate, and clean up uncontrolled hazardous waste sites. The National Priorities List is a published list of hazardous waste sites in the United States that are being cleaned up under the Superfund Program. No Superfund Program sites were identified within Clark County (EPA 2003).